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Health Problems in National Defence Areas*

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I WISH to discuss a few problems which have been a considerable worry to me as Commissioner of Health, as well as to my confrères in Halifax, during the past year or so, and add my own impressions of how these might be better handled. I hope to have your criticism in the discussion that follows.

First, however, I feel that I should give you a picture of the health organization in Halifax at the outbreak of the war, and a general idea of the change that war has made, so you will understand better the local situation. This is not given as an excuse, because we should have been better prepared and should now be even better equipped than we are to deal with existing conditions.

In August 1939, Halifax, with an estimated population of 65,000 people, had no full-time health officer. The position of City Medical Officer which I had occupied for about a year and a half was a part-time job and most of my time was spent in purely clinical work at the City Home and in the Police and Fire Departments. I was in charge of the ward patients in the Infectious Diseases Hospital, a 45-bed institution, fairly well equipped and adequate, I believe, for normal times. I had no connection with the Health Board, which was composed of six aldermen and a local physician who acted as chairman. The secretary of the Board, a layman, was the executive officer and chief sanitary inspector. During the winter of 1939-40, I took a public health course at Johns Hopkins University, on leave of absence from the City, and another physician carried on for me—still on a part-time basis. I returned in July, but not until October, 1940, were my services secured on a full-time basis, with the idea of my making a survey and

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bringing in suggestions for the modernization of the Health Department. This was all too late: already Halifax was on the eve of a nasty epidemic of a *Gravis* form of diphtheria, which proved to be one of the largest outbreaks yet recorded on this continent. The first cases were already in hospital and the first death had occurred.

The children of the city had not been immunized, except for a few by private physicians in their own practice and a few at the Dalhousie Public Health Clinic, and no organized Health Department program had been attempted. Immediately the number of toxoid clinics was increased and, with the assistance of the Provincial Department in making announcements and supplying personnel, this program was stepped up until over 4,000 free injections of diphtheria toxoid (supplied by the Connaught Laboratories, University of Toronto) were given in one week. This program first reached the school children, and then we attempted to impress the adults that the preschool children should be immunized. The old, familiar story of deaths being in the younger age-groups was found to hold true, but the large number of cases among adults was immediately noticeable. Further Schick testing of the adult groups soon showed that figures quoted in older public health publications were out of proportion with our figures. We found in different groups from 60 to 80 per cent of adults giving positive Schick reactions and in the first month of the outbreak more than 54.6 per cent of the cases were in those over 15 years of age. This condition was rather alarming and I immediately urged on the population that all ages should be protected.

As time passed, the high incidence in adults continued and members of the Forces, mainly the Army and Navy, began to contract diphtheria. By January 1941 their Hospital for Infectious Diseases was filled. In company with the Provincial Department of Health, as well as the Federal Department of Pensions and National Health, our Department had previously urged upon the Department of National Defence at Ottawa the complete testing and immunization of the Forces. I stunned Ottawa when I suggested the isolation of one of the Naval barracks unless immediate action was taken. However, immunization was begun then and has since been part of the public health program of the Forces. Its value can well be seen in the figures for the past winter, the second year of diphtheria in Halifax.

The civilian population has had 660 cases in the last eleven months as compared with 588 in the previous eleven months, and the percentage of those over 15 years of age has been 50.9. In the Forces there have been 161 cases as compared with 293 cases. This decline, I believe, is due to the toxoid program, in spite of the presence of raw recruits and new drafts of men not previously immunized. This is an excellent showing and gives further evidence of the value of toxoid, but the lesson to be learned is that not only is it important to prevent diphtheria in children, but it must also be considered a disease of adults and controlled in them as well, if we are to eradicate it. An interesting point was discussed in a paper by Wheeler and Mortion (1) at the meeting of the American Public Health Association in Atlantic City in October 1941 in reference to diphtheria's being more of an adult disease in the northern latitudes and increasing

in incidence the farther north one goes. A study of epidemics in Alabama, North Carolina, Maryland, Massachusetts and Nova Scotia showed the trend towards an older age group being attacked the more northern the latitude.

Thus it will be seen that diphtheria has been a real problem in Halifax and, I regret to say, still is amongst the civilian population. Even the use of diphtheria toxoid has not controlled it, but only because its use has not been widely enough accepted.

Next in importance among the communicable diseases is meningitis. Possibly this disease and diphtheria are all the more prevalent with us because of the overcrowding and poor housing conditions which I shall discuss later.

Meningitis was first seen, in epidemic form, among the troops arriving in Halifax in April 1940. The first case in the civilian population occurred during November 1940, and we have had 151 cases in the intervening twenty months. With the meagre amount of epidemiological study and follow-up that I have been able to give to it, only once has a secondary case been seen in the same household or been directly traceable to a primary case; but remember I said *meagre*, and the follow-up in Halifax of contacts with possible cases in the Forces has not been possible at all.

Some of the following statements are only observations, while others are facts which can be substantiated to some extent. The cases have occurred in all walks of life and have come from the better classes without overcrowded home conditions as well as from the slum areas, and I believe that the amount of stress laid on overcrowding is not justified. However, I do believe it has a part to play. We attempted no culturing of contacts during the winter of 1940-41 as my staff was too small to carry it out and I had no time myself, but this past winter I made a closer study. The following facts are taken from two cases occurring during February and March of this year.

Case 1 (A.V.), male, age 34.

Admitted to hospital 5.00 p.m.; died 11.00 p.m.; sick thirty-six hours before admission; lived in rooming house; clinical diagnosis made one hour before admission. Cultures taken on family and other roomers showed 12 positive cultures (46 per cent) among the 26 persons living in this house.

Case 2 (J.M.), female, age 8.

Admitted to hospital 7.00 p.m.; died 11.00 p.m.; sick thirty-six hours before admission; 5 contacts in house, 3 positive. Of 15 neighbours, contacts of the case and of carriers in the home of the case, 10 were positive. That is, a total of 13 out of 20 (65 per cent) were positive.

In February 1941 a similar family investigated by Doctors Dingle, Thomas et al from Harvard University showed 6 with positive cultures in a household of 12 (50 per cent). The detection in Halifax of a carrier rate of 65 per cent or so in some homes where a case developed was possible only through the assistance of Dr. D. J. MacKenzie, of the Provincial Bacteriological Laboratory. To me it is a revelation and shows a carrier rate higher than I have ever seen

recorded. These carriers are all treated by the sulpha group of drugs and are recultured at 48-hour intervals, two negative cultures being required before release from quarantine. Most of these carriers become negative following 48 hours of treatment. As reported in the *Journal of American Medical Association* (2), sulphadiazine and sulphapyridine in the form of soludagenan have been our choice in treatment and I believe that our results have been favourable. The two cases mentioned above, both fatal, gave one no chance for therapy, as both were unconscious and almost moribund on admission. Many problems have interested me concerning this disease, but outside of the follow-up mentioned above, time has not permitted any further study and I regret very much the opportunities which have been lost because of lack of epidemiological assistance and time to follow and study these further.

Third I place scarlet fever, which was fairly common in Halifax during the winter of 1939-40, when there were 154 cases. In 1940-41 some 476 cases were reported in the civilian population and 253 cases in the Armed Forces. Fortunately, the case fatality rate was low and to the best of my knowledge there was only one case which ended fatally, from a streptococcal abscess of the hip joint as a late complication. Our hospital could not cope with this additional epidemic, and a club-house was commandeered as a temporary hospital or annex to care for scarlet fever cases. During the past winter the disease has been almost absent; in fact, I believe that the incidence has been below a normal peace-time 431 cases, as compared with 15 in the previous year.

Measles was quite prevalent in the early part of the war, especially among the Forces, where it was quite prevalent for a few months, and this was followed by a rise in the incidence amongst the civilian population. In 1940 there were 431 cases, as compared with 15 in the previous year.

Whooping cough has been present, but not in large proportions. In combination with my diphtheria immunization program, I have been following up and attempting to immunize after the second Schick test, using pertussis vaccine supplied by the Connaught Laboratories.

Mumps made its appearance in the Army late in the fall of 1941. The civilian population so far has escaped this fairly well, but a few cases are now coming to our attention and I expect that we shall have more. I am informed by my colleagues in the Forces that almost 60 per cent of the cases have developed orchitis, in spite of the hospitalization and rest. This appears to be a fairly high percentage.

The increase in the population of Halifax and its surrounding suburban area is marked. The census of 1941 gives the population as 69,326. This disagrees sharply with the population as estimated by Might Directories Limited, who publish the City Directory, and who estimated the population in May 1941 as 87,146. Our death rate, based on the census population uncorrected for residence, is 18.01, and our birth rate, also uncorrected for residence, is 37.39. When calculated on the estimated population the crude death rate is 14.44 and the birth rate is 29.74, and even these figures are high.

This, however, gives you some idea of the amount of congestion which has

arisen due to the war. The influx of wives and families of members of the Forces has been great and in addition other families have entered the city, the father working at some war work on the waterfront, in the shipyards, or in one of the building trades. It is impossible to get certain types of work done and all mechanical trades are working overtime.

We had in Halifax previous to the outbreak of the war some one hundred and fifty houses which had been condemned as not fit for habitation, and schemes of housing had been talked of but were still in the minds of those concerned with the problem and not even on paper. This housing condition, with the influx, has made for a condition of overcrowding I do not believe equalled elsewhere in the Dominion. The over-work, the extra stress and strain of war, and poor living conditions, give me cause to fear not only the continuance of the troubles which we have with us now and the possibility of their spread, but also the increasing problem presented by tuberculosis, venereal disease, and other communicable diseases.

Housing is bad, and even with the addition of 490 pre-fabricated houses put up by Wartime Housing, Limited, there has been little or no relief.

The tuberculosis death rate has always been high in Halifax. The 1941 figures, the latest year for which complete figures are available, show a death rate of 105 per 100,000 population. This is over twice the rate for Canada as a whole, and with the overcrowding and a lack of hospital space we can look forward to a definite increase in our rate. I believe that the City is now preparing to increase the capacity of its tuberculosis hospital from sixty-five beds to one hundred and fifty. This additional number of beds may aid in the segregation and treatment of active cases. A tuberculosis survey has been recommended and is urgently needed.

Venereal diseases are always a health problem, but in a seaport city it is much more acute and in wartime in an area with thousands of members of the Forces in the immediate vicinity it becomes a problem of great magnitude. We have worked systematically with the Provincial Department, which directs venereal disease control, and have attempted to place under treatment those found infected or reported as sources of infection. The Forces have assisted us in this work but finding the cases or the source of infection is still the major problem here. Until some social hygiene workers can be added to our local Health Department, I feel that it will be very difficult to trace cases and contacts. Sources of infection are reported by the Forces when they can be obtained, but this is not a very satisfactory method, as many names given us are fictitious, and others are only first names, and the addresses given are not satisfactory. This is where social hygiene workers, in my opinion, can possibly find these suspected sources. This is a necesary work for the solving of this important problem in all areas where members of the Armed Forces are present in large numbers. Frequent conferences between Medical Officers of Health and the Hygiene Officers in all matters mentioned above are important, and constant communication and co-operation are of great value, as in all fields of public health.

This seaport city sees thousands of sailors, soldiers, and airmen on the

street one day and the next day the sidewalks are crowded only with civilians. Another convoy is on its way and manning pools and embarkation depots are empty, but only for a few hours and again they start to fill. The ever-changing harbour scenes, with ships of all nationalities, their crews ashore possibly for a last wild fling before braving the Atlantic and the Axis submarines, possibly leads to a little laxness on the part of the police in cleaning up the waterfront dives. Actually, however, the reported sources of venereal disease are not from here but from amateur prostitutes functioning as waitresses or factory workers. Oddly enough, no increase of venereal disease in the civilian population has been reported by physicians or the Provincial Clinic, but there is a high incidence in the Forces. The City Prison, where many Merchant Marine men are held, also has a number of cases far above normal.

Another problem which I feel I must mention and which has been acute in Halifax is the overworked general practitioner. With some 30 per cent of our active men already in the Services, and the large increase in the population requiring considerable medical care, this problem is acute. The speed-up of the course in medical schools will help only slightly, if at all. The problem of nurses and of nurses with a qualification in public health is also most serious. Even our hospital staffs are depleted in many instances, and to get nurses with public health training is almost impossible.

Halifax has very few additional hospital beds today. Additions since the war comprise a temporary wing on our General Hospital to take care of sixty beds, a temporary Navy hospital of two hundred beds, and a permanent one of two hundred beds under construction, and a wing on the Military hospital accommodating some fifty beds. To get a civilian patient hospitalized for anything other than an acute condition is impossible. The hospitalization of Merchant Marine men and torpedoed ship survivors has been an added burden. The Provincial Government is now contemplating a new and larger General Hospital to replace the present 85-year-old Victoria General Hospital.

Another problem we have had to contend with is our municipal water supply. The increased population, the tremendous expansion of naval and military and air-force barracks, the additional naval ships requiring this service, as well as thousands of merchant and cargo ships awaiting convoy and requiring millions of gallons, have put a strain on this important utility. During the winter, many complaints come to us of water being unobtainable during some hours of the day in high areas of the city. This might have been a serious problem had not the City, in conjunction with the Federal Government, awarded contracts in order that additional lakes might be made part of our source of supply and extra mains laid to bring this supply into the city. A new reservoir was also built in the city limits to carry some of the load during the heavy hours and also to give additional fire-fighting protection. The water from these new lakes requires pumping to our present supply and it then will be fed by gravity to the city. Fortunately, no treatment other than chlorination is required. So far, no epidemics of water-borne disease have occurred.

Our milk supply has also required to be expanded to meet this extra market.

The time required for inspections and keeping this service up to standard has been a problem. I fear that at times our children have had to forego fresh pasteurized milk because the ships and Services have depleted the supply. The increase in the size of the milk shed has required considerable additional work for our veterinary inspectors and we have had to supervise the dairies of the city, as they had only small pasteurizing equipment. This additional burden and the lack of trained helpers has had a tendency towards some laxness which we have detected, but the matter has been taken up with them and I have already found an improvement. The city has no compulsory pasteurization by-law, but through public health education, I am able to report that this past year practically 100 per cent of our milk has been pasteurized.

A.R.P., or as we call it in Halifax, Civilian Emergency Committee, has required the organizing, equipping, and training of personnel for eighteen first-aid posts and three casualty clearing stations. This work is now in charge of the St. John Ambulance Association and Brigade, while emergency hospitals and evacuation of present patients to make room for accident cases, comes under the Red Cross. Both of these organizations have required considerable of my time as chairman of the First Aid and Rescue Committee. We in Halifax still recall 1917 and the explosion which caught us unprepared and taught us a lesson. Today we are in a much better position to handle anything which the war may deal out to us.

In closing these brief remarks about our health problems, I hope you have been able to picture them and when you read a news report dated from an "Eastern Canadian Port" I hope you will have a better idea of what the Health Department in that area has had to contend with and what it is attempting to do for public health in a vital national defence area.

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Nutritional Planning*

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BY nutritional planning is here meant the coordination of every phase of food production, processing, distribution, and preparation on a nutritional basis so as to make it difficult for anyone to eat anything but an adequate diet.

Adequate nutrition is more than just how you cook, it is more than just what you select. Adequate nutrition includes the proper storage of foods, and is concerned with how they have been processed and how they are distributed, but, above all, it demands sufficient production of each food needed.

It must be said at once that agriculture in Canada has never really been organized so as to encourage the production and marketing of foods in amounts needed for adequate nutrition. So far as I have been able to find out, no actual nutritional standards for agricultural production have ever been used.

Several months ago, I calculated the amounts of milk, cheese, fruits, vegetables, meat, butter, eggs, etc., needed to feed every Canadian adequately, and these seem to be the first such Canadian calculations made in a comprehensive manner. So little knowledge is available on actual production of many of these items in Canada that it is still impossible to say how much increased production of cabbage or of eggs, etc., would be needed to meet these requirements, but it is safe to say that increases of many foods would be needed. For example, milk production would have to increase at least 23 per cent. Naturally, the picture is complicated right now by the demands for exports, for ship's stores, for Red Cross parcels, and for the armed forces. Nevertheless, a nutritional plan would add all these up together and see that production is adequate. Such a plan is in contrast to our present disjointed policy of shipping out of the country everything that is requested, without proper care for what is left for the Canadian public. Yet that is what is happening, because we have inadequate agricultural planning on a nutritional basis.

Bermuda Experience

An example of this type of planning on a small scale is afforded by conditions in Bermuda recently. At the request of Bermudian authorities, I spent a short time there to assist in planning their food problem on a nutritional basis. Table I shows some of the figures used as a basis.

**An address to the Ottawa Dietetic Association given on November 23, 1942.*

TABLE I

Food	*Annual Requirements for Minimal Nutrition for Bermuda*	*1942 Bermuda Production*	*Imports Needed*
Milk	14,337,000 lbs.	6,000,000 lbs.	8,337,000 lbs. (fresh or its equivalent)
Potatoes	6,502,000 lbs.	6,500,000 lbs.	nil
Green vegetables	1,333,000 lbs.	700,000 lbs.	633,000 lbs.
Tomatoes	2,752,000 lbs.	1,058,000 lbs.	1,694,000 lbs.
Eggs	489,000 doz.	300,000 doz.	189,000 doz.

Similar calculations were made for fruits, meat, cereals, butter, sugar and sweets. Owing to problems of shipping and storage, this was broken down into requirements for each three months of the year. Since imports are such a problem, the Department of Agriculture in Bermuda agreed to increase production of some commodities so as to meet these nutritional requirements. Since a change in food habits is inevitable, the members of the Department agreed to my suggestion that they sit in Committee with the Rationing and Prices Board, and with the Departments of Education and Health, to plan how to tell the people what is going on. Bermuda is thus on its way to a planned and co-ordinated policy which *may* give all its people better health than ever before attained there.

DANGER TO HEALTH IN CANADA

The same thing could be done in Canada, but only a slight start has been made. Of course, the problem is much more difficult, but there is every chance that the lack of a coordinated plan sufficient to include our exports, our special demands for ships, food bundles and armed forces, will lead to serious shortages of foods available for Canadian civilians next year. Instead of following Britain's lead in arranging complete food control so that the level of health may actually be improving during wartime, Canada may provide an example of a serious decline in health. While working conditions, and housing, and other factors influence this health picture, food has an important role. It is a controllable role, yet we are not coordinating its control.

PRICE CONTROL NEEDED

It should be said at once that such nutritional planning for agricultural production is only part of what is needed for success. You cannot exhort a farmer to produce the crop you want unless a reasonable market is guaranteed, or, in other words, unless a reasonable price is assured. Some type of price control is probably essential in this plan, and not just for wartime. In Great Britain now the Government is the purchaser of food. It pays the farmer what is right for a decent standard of living, and regardless of the price to the ultimate consumer. The goods are then sold at prices suitable to conditions of supply, etc. In general, a loss is sustained which amounts to a subsidy directly to the farmer so as to keep his cooperation. Such a loss is well worth-while for the sake of

hearty cooperation in a plan for adequate nutrition. That may not be the best way to do it, but it is one way. And it is working right now, not only to make British farmers happy, but also to produce the exact foods that the government wants, in order to further the government's desire for the general good health of the people, in so far as adequate supplies of the right foods will assure it.

Well, let us leave primary production. Let us suppose a miracle has happened and Canada is really producing the amounts of every foodstuff needed so that we could export and still have all Canadians adequately nourished. Let us even suppose that we are producing more than current needs so as to guard against a poor crop year. This means that some of these products must be stored—maybe fresh frozen, maybe in a root-cellar, maybe dehydrated, maybe canned in home or factory. It seems reasonable that, having produced nutritious food in adequate quantities, we should plan to retain as much of the nutritive value as possible. This means some measure of control over various branches of food processors and distributors.

PROCESSING AND STORING

If processing and storing for a carry-over are thus guided by nutritional standards, then all processing of foods might logically be controlled. This raises the question of the nutritive value of many packaged foods. It may be said in favour of processed and packaged goods that they have frequently served a useful purpose in making a product keep well, in making it easy to distribute and cleaner to handle; more recently, convenience of preparation has also become important. But it must be said against most food industries of this type that, while striving for all these features of sanitation, convenience, etc., *they have not striven to make as nutritious a product as possible.* The time has come for all food industries to do a little self-examination on the question of whether their product is really as nutritious as it could be. Has it, for example, retained as much of the original food value as possible?

This is a different angle from the current trend of food industries to say that just because, for example, their noodles contain eggs and milk they are very nutritious. Perhaps they are, but we should examine everything that went into those noodles to see that wastefulness has not occurred, and that the product is just as nutritious as it can be; in other words, that it really contributes to our goal of making it difficult for the public to get anything but an adequate diet.

From this, of course, it might follow that some products might have no place at all in our nutritional plan, but much more information than is available right now is necessary before making such statements.

Now our nutritional plan has not only an agricultural production geared to its requirements, but it has also controlled to some extent the nutritive value of all stored and processed foods. Many interesting details are being omitted but some mention of dehydrated foods should be made. Many extravagant claims are being made for dehydrated foods, especially in the United States. Although a fairly good job can be done on colour and taste, it must be pointed out that,

speaking generally, more destruction of vitamins takes place than in canning or freezing. Problems of stability on storage and of cooking are still being explored, and the place of dehydrated foods in the future is at least an open question.

Having produced the right foods in sufficient quantities, and stored or processed them all according to our nutritional plan, it is now necessary to assist the consumer to acquire suitable amounts of the right foods. In fact, it should be made difficult for him not to get the proper amounts of the right foods.

DISTRIBUTION TO CONSUMER

This means several things: (1) consumer purchasing power, (2) organization of retail stores so that they help the consumer, (3) recognition of nutritional needs of special groups, and (4) education. By this is meant that the purely economic idea of purchasing power is not enough. Those purchases must be guided in several ways. Consumer information is very important, but it is not enough, unless it applies also to retail stores. Furthermore, there must be arranged special supplies for those who have special nutritional needs. For example, the need of every expectant mother to certain extra foods should not only be recognized but actually met by allocation. Then, too, industrial groups may need a special allotment, because industry of the future is not likely to be able to ignore the value of assisting its workers to obtain an adequate diet. Furthermore, it may come to be realized that proper feeding of school children is an essential part of a program aimed at controlling nutritional status for its contribution to the health of the nation. It would certainly help to teach sound nutrition and would save money by its brightening effect on apparently backward pupils, who are often retarded by inadequate nutrition.

Our nutritional plan has now come right to the consumer, in his home, and at his work. Naturally, much remains to be done in seeing that proper cooking methods are used, and (just as important) that during the serving of food, it may retain all possible nutritive value. In fact, if you want to carry this nutritional plan to an absurd length, you would even specify how much the food should be chewed. For example, there is evidence that what little vitamin C there may be in an apple has disappeared before you swallow it, if you have chewed it very well. But that is carrying our nutritional plan too far, because it is simpler to allow a margin of safety sufficient to take care of many such uncontrollable factors.

This question of a margin of safety raises the question of what standard of requirements should be followed. Some requirements have been set up on minimal levels to prevent disease, others are on various higher levels. Present standards represent the best available opinions on food requirements in order that food may make its full contribution to health, happiness and efficiency, and are not aimed just to help us avoid certain deficiency diseases. These opinions are not always backed up by experimental or clinical evidence, but this is no reason for refusing to use this aim in our nutritional planning. It may be years before

a nutritional plan is even partly in effect, and in the meantime the evidence may accumulate to convince anyone of the validity of our standards.

SIR JOHN BOYD ORR'S WORLD PLAN

Even now this dream is beginning to come true. Sir John Boyd Orr, the great British nutritionist, envisages some such nutritional plan for the whole world, and a post-war economy built on satisfying the human needs of food and shelter. He foresees the whole world organized to produce adequate food for everyone. While he has never elaborated the further organization of processing, storing and distributing food which has just been mentioned, it seems to be a logical part of the plan. This great vision is one of the most fundamental things emerging from this war.

The important thing is that this dream, whether national or world-wide, can come true. Every professional person should study its possibilities and work toward its realization. Proper nutrition for everyone would make an enormous difference to the nation by its effects on expectant mothers, on the life and health of the babies of the nation, on the teeth and general activity of the children, on their ability to learn in school, on their efficiency at work, and finally on their years of happiness and usefulness. It can only come about by some coordinated planning and control *on a nutritional basis*, beginning with primary agricultural production and including price control, storage, processing, distribution, and consumer information.

ERRATUM

In the article "Observations on Cholera Vaccine" by L. E. Ranta and C. E. Dolman, published in the January issue of the JOURNAL, an error appeared in the section headed "Variability of Agglutinin Response in Rabbits to Different Lots of Phenol-Killed Vaccine". The following sentence (page 31, line 7 of the text) should not have been included: "Although the vaccines were all produced by the same method, they evidently varied considerably in 'O' and 'OH' agglutinogenic capacity."

The Growing Recognition of Public Health and Preventive Medicine

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THE seventeenth convention of the *Association des médecins de langue française de l'Amérique du Nord* was successful beyond expectation. One thousand colleagues showed, by attending, their adherence to an idea which, since 1900, has been the key-note of these meetings: the scientific progress of those doctors who, in this corner of the world, have jealously guarded, with their culture, the dulcet language of France. All the speakers regretted the absence of the French delegates who, at each convention, used to come to greet their American cousins on behalf of the former mother country.

The scientific value and the high literary standing of the contributions demonstrated more and more clearly the advancement made in every sphere of medicine, surgery, health, preventive medicine and the several specialized branches of practice. It is a pleasant task to pay tribute to all those who contributed to the unprecedented success of this convention. We cannot fail to mention in particular Doctors R. E. Valin, Donatien Marion, Oscar Mercier, Roma Amyot, P. Smith, J. P. Bourque, and G. Manseau, whose organizing genius and dynamic enthusiasm galvanized the convention to attaining success.

With these preliminaries disposed of, let us admit a most remarkable fact: in the greater number of addresses the idea of public health and preventive medicine occupied the first place. At the outset, under the chairmanship of Dr. J. A. Baudouin, the health section committee had organized three meetings during which sixteen speakers presented excellent reports on health in general, syphilis, and tuberculosis.

Matters devoted to public health and preventive medicine are usually presented at a medical convention; but this is the first time, we think, that so many speakers insisted with such complete unanimity upon the ever-growing importance of these two branches of contemporary medicine.

On the opening evening of the convention, the President, Oscar Mercier, said: "After three centuries of attentive care lavished by French medicine, French-Canadian medicine is a living reality. The troubles of France have forced us, the French-Canadian doctors, to adopt a new order which consists in creating a French-Canadian medicine. This will of necessity possess the qualities of the French spirit but it will be adorned with those originating through American genius, which shall continue to be added because of the relationship, becoming more and more intimate, with our neighbors to the south."

Yes, French-Canadian medicine must retain or acquire the qualities of the French spirit and of American genius but it must also conform to the tendencies

of French and American medicine. And, both in France and in America, medical science is clearly tending towards the prevention of disease. P. Delore made this very explicit in his wonderful book, *Tendances de la médecine contemporaine* (Trends of Contemporary Medicine), and Harvey Cushing spoke in like manner when he said that "medicine has come to the cross-roads."

This is the new order, based, not on domination of one nation over others, but on the establishment of a system in which knowledge of health will contribute to the happiness and prosperity of individuals and of nations. We were not surprised when the President of the College of Physicians and Surgeons of the Province of Quebec, Dr. J. E. Desrochers, at once seized upon this idea of a new order, launched by Dr. Oscar Mercier. Dr. Desrochers said: "We are inaugurating this evening a new order, as the president said in opening this congress, thus giving us to understand that, although deprived of the light which came to us from France, we would henceforth be obliged to hold high the torch of French science in America. It is a heavy task, one that would cause the most courageous to falter.... Knowledge will therefore be the objective which also beckons us onward, for science alone would be a very poor servant of humanity did it not deal with spiritual values.... The individualism which has prevailed up to now must in future give place to more altruistic endeavours. A new element has entered into the life of a doctor, the social factor. Whatever reluctance we may experience in breaking off acquired habits, however hesitant we may be to lay aside our prejudices, the method of practising medicine has changed and will continue to do so. And the sooner the doctor recognizes this truth the better it will be for him, personally, and for the whole profession."

And, Dr. Desrochers might have added, "the better it will be for the public," for he is of that opinion.

This reminds us that, in his "Medicine, Science of Health," P. Winter wrote: "The doctor of today, who is obliged to substitute science of health for the narrow science of disease, has the task of destroying such a formidable error which has lasted through the ages."

It devolved upon the Hon. Henri Groulx, Minister of Health and Social Welfare, to speak for the State: "It may seem strange," he said, "that I am insisting upon the strict collaboration which should exist between medicine and the State and that I often repeat the urgent need of submitting to the principles of preventive medicine. I dare believe, however, according to an old saying, that I may reiterate the same thing several times without repeating myself. It was said in the past: 'The medicine of the future will be preventive medicine, health.' Time has accomplished its work. It is admitted today that the improvement of the health of our people would be more general if we followed the advice and instructions of specialists in public health matters. We have within reach more than one means of halting the march of certain diseases and preventing epidemics. Nevertheless, in order that this work shall produce the desired results, it must be accomplished with the co-operation of the public under the direction of our doctors."

This co-operation will only be assured by preparing our future doctors and

our teachers to play their part as educators, on the one hand, and by teaching health and preventive medicine to the public, on the other.

It was P. Delore who wrote: "The teaching of hygiene shoud be a veritable education in health. All teaching of personal or public health, to whatever extent it is carried, should have an educational bearing, should be accomplished in a moral sense. It should inspire consciousness of duty on the part of every individual towards himself and the community. The doctor, the public health doctor in particular, should be more fully imbued with this educational, moral and civic duty." And Delore quotes a phrase from P. Winter which opens the perspective towards a new world: "The world today needs doctors who are educators as much as those who are healers."

We may be permitted to remind the Minister of Health that Professor Sergent asked but recently that the first years of a medical course be devoted to the healthy man. And it is not so long since Dr. Justin Godard suggested that the Department of Health should be just that and not a department of sickness.

In a delightful, improvised address, His Worship Mayor Adhémar Raynault of Montreal greeted the delegates and added: "After the war, in health as in everything else, there must be a new order, so heartily wished for in the world. Doctors must not only heal, they must also prevent sickness, and when they are enjoying the intimacy of the family they can, with that disinterestedness which is to their honour, disseminate those principles which tend to preserve health. It is in this way that they will continue to fulfill a most important duty to the end that public health may reach its highest aims."

In a word, the first citizen of Montreal, who, for years, has worked in the interest of the welfare of his citizens, also expresses his own dream of a new order where the prevention of sickness will be the daily program.

The guest speaker, Dr. Adélard Groulx, Director of the Department of Health of Montreal, quite naturally emphasized the importance of public health. Here are a few citations from his address:

"The usefulness of professional conventions is accepted without question and, if proof were needed, we find it here. They are a necessity in our medical life. They allow of closer contact with various groups of the profession: the laboratory man, the university faculty, the hospital doctor and the practising physician, and, I might add, the public health doctor. From a social point of view, it is an occasion to meet our colleagues and the official authorities. Moreover, conventions allow of the development of the most recent scientific data in the several fields of medical action and they also help the advancement of science. In organizing this convention, provision was made to include public health, which plays a most important part in our medical life. As a matter of fact, public health follows very closely every development in the medical field which is itself taking the path of preventive medicine.... The doctor's role is important in the fight against maternal and infant mortality, contagious diseases, chiefly smallpox (which has disappeared), diphtheria, tuberculosis.... The co-operation of the medical profession is necessary for the success of public health."

There are many useful ideas in these few sentences. Let us keep two in

mind: the inclination of our profession towards preventive medicine and the collaboration of the practising physician in public health. How can this co-operation exist if the doctor does not pass along to his patients the knowledge of how to prevent sickness?

The address of our new President, Dr. Chas. Vézina, Dean of the Medical Faculty of Laval University, will remain famous in the annals of our conventions.

"At our conventions," said he, "we speak chiefly of sickness and how to cure it. Why, at our next convention, could we not speak of the means to prevent sickness? Why not hold a convention on preventive medicine? The duty of preserving health is not the duty of the State alone, it is also the duty of doctors. Here, much progress in the realm of public health has been realized through our boards of health; but how much is there still to do! . . .

"If we look around us, we will notice that the Province of Quebec has the highest mortality rate from tuberculosis, typhoid fever, and diphtheria, as it also has the highest rates for maternal and infant mortality. Our birth rate is still quite high but what benefit can we derive therefrom if we allow children to die as well as the mothers who gave them birth? . . .

"We often speak of our national pride, we pretend to be proud of our origin, our ancestry, our language. We are right. All that is very good, very fine. However, no nation should live solely in its past, it should also look to its present and future. Has it not been said that the degree of civilization of a race can be measured by the condition of its health?

"You will agree with me that our medical body (I do not wish to speak of our organizations, federal or provincial) has not taken sufficient interest in preventive medicine and public health. We have been engaged chiefly in treating our patients and defending our professional interests.

"In any event, it seems to me that a convention at which would be studied maternal and infant mortality, nutritional hygiene, school and industrial health, pasteurization of milk—which is still the cause of much spilling of ink in this province—could be of great benefit to the medical profession and to our population.

"We would like to see our doctors apostles of public health and preventive medicine, each in the field of his endeavours.

"Our governments are already studying, for post-war purposes, such problems of public health. It seems to me that the medical profession should not remain inactive. That would perhaps be a means to prevent the imposing of State medicine or a system of sickness insurance which would be repugnant to us.

"On the other hand, I am sure that our association, the members of which are numerous, could, through its influence, induce the public powers to adopt certain measures of a nature to improve the health of our public. If we accomplish this great duty, we can then say that we are proud of it."

Thus spoke the new president of the *Association des médecins de langue française de l'Amérique du Nord*. Dr. Vézina is not a public health man, he is a surgeon who enjoys a great reputation. He is a man possessing a wonderful personality, charming and affable. His address caused consternation among

certain doctors. They were amazed to see the president probe the sensitive flesh of their professional concepts with such unfeeling directness! They were surprised to hear a man, so wise and so dignified, trumpet his thoughts so clearly and announce the holding of a convention where public health and preventive medicine would hold first place!

And yet Dr. Vézina is right. He insisted on speaking as he did because he sees the future clearly before him. Throughout the world, medicine is winging its way towards prevention of disease. There will always be healers among the physicians because there will always be unpreventable sickness and, inevitably, suffering to allay; there will always be healers because there will always be those who will not have the sense to avoid preventable illness. Nevertheless, as civilization progresses, medicine will become more and more the art and science of preventing illness; to be quite up-to-date, therapeutics will have to be taught jointly with social and public health. Whether we want it or not, whether we like it or not, that is progress and this progress is for the greater happiness of the human race.

We can no longer remain indifferent to this great advancement and if, unfortunately, the doctors of 1943 did not realize that medicine has developed they would be obliged to face a situation which would not be tenable, for the spectre of State medicine would not hesitate to take form as a reality before which doctors would have to bend the knee—unless they give ear to Dr. Vézina's warning alarm.

We are no longer living in an age when surgeons immersed amputation stumps in boiling oil. We have emerged from the era when doctors ridiculed vaccination, laughed at microbes, antisepsis and asepsis.

Pasteur and his followers, in France and in every country, opened up, by their research, their work and their discoveries, a new field of action for medical sciences and unlimited horizons, not alone in the art of comforting and healing, but also in that of preventing illness which affects "our brother body." Alas, in promising to push back the frontiers of life, Pasteur harbored the illusion of believing that science would succeed in banishing wars; he was mistaken, but, if he could return to earth, he would be happy to see that medicine is clearly taking the road towards hygiene and preventive medicine.

Let us hope that, in 1944, when the eighteenth convention of the *Association des médecins de langue française de l'Amérique du Nord* is held, victory shall have crowned the efforts of free peoples and that we can then devote all our energies to the elaboration of a formula of healthful living for our contemporaries.

A Study of the Effect of Fixed-Pace Work Upon Health*

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"FOR every type of work there exists an optimal speed, which will make it possible to get as much as is possible done with the least expenditure of energy and without increasing the feeling of fatigue, discomfort, and ill health. The determination of these speeds, from the viewpoint of human efficiency, is an almost untouched field. They have been fixed again and again, for many types of work, with respect to highest rate or amount of production, but there is reason for believing that this rate often conflicts with the optimum welfare of the worker" (1). In the absence of satisfactory evidence it has long been suspected that high-speed work might often be detrimental to the health of the worker. It was for the purpose of throwing light upon this issue that the present investigation was undertaken.

THE NATURE AND INCIDENCE OF FIXED-PACE WORK

Highly repetitive fixed-pace work may be regarded as an outcome of the application of the principles of "scientific management" to industry. The main purpose of "scientific management" is to increase plant efficiency. This calls for greater output and cheaper production. Speed-up is the result. This speed-up of production in industry has been made possible by minute specialization of labour, standardization of product, the conveyor system, mass and straight line production.

The use of conveyors and other mechanical devices has largely eliminated the heavy work involved in handling and transporting materials. This, in itself, has made it possible for workmen to produce a larger number of articles in a unit of time with no greater output of energy. In addition, where products have become standardized, work has become highly specialized so that a workman has not only to learn a relatively simple task involved in the manufacture of a particular product, but also is required to repeat that operation as many times as he can in a working day. Thus mass production tends to involve many workers in light, repetitive work.

A further device for increasing plant efficiency has been the regulation and fixing of the rate of working by conveyor belts and by machines which must be fed. This has required many workers employed on conveyor belts or engaged in machine feeding to do highly repetitive *fixed-pace* work. The present investigation was concerned with certain of the effects of work of this description.

**An abstract of a thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy in the University of Toronto. The work was done through arrangements made by the Division of Industrial Hygiene of the Department of Health of Ontario.*

Although the number of workers engaged in this type of work is not known, it is probably large enough to command attention. Writing in 1929, Chase (2) estimated the number of individuals engaged in "monotonous repetitive machine work" in the United States to be approximately five million. Even if the ratio of repetitive machine workers to total population is considerably less in Canada, there is probably a quarter of a million such workers, many of whom would be working at a fixed pace. Thus the question of the effect of fixed-pace work upon the health of the workers may be of considerable significance.

THE PROBLEM AND ITS SETTING

Although there has been abundant conjecture concerning the effects of repetitive work upon health there has been relatively little careful investigation. The points of view expressed have been determined largely by the particular prejudice of the individual. Labour unions have complained of the harmful effects of repetitive work upon the health of workers (3) while industrialists have insisted that such work had no harmful effects (4). Since management is vitally interested in efficiency, much is known concerning the effects of various conditions of work upon the worker's efficiency. It may be added that these are essentially short-time effects. A new method of work is advocated, put on trial for a few weeks or a few months and, if efficiency is increased, it is eventually adopted. Much less interest has been shown in the health of the worker, especially in regard to the long-time effects of work.

That there is lack of evidence concerning a possible relationship between health and a repetitive type of work may be due in part to the fact that in many factories adequate health records are not kept. Furthermore, it is probable that companies which keep such records tend to be those in which conditions of work are relatively satisfactory.

The purpose of this study was to determine whether fixed-pace work, particularly of the conveyor type, had any measurable effect upon the health of the workers as judged by their health records over a period of years.

THE METHOD USED

The investigation was based upon a study of the production and sickness records at three plants. Through the courtesy of the respective managements data were collected concerning a total of 1033 employees, 362 men and 177 women in Plant A, 282 men in Plant B, and 212 women in Plant C. In each plant a distinction was made between fixed-pace workers and non-fixed-pace workers. These groups were then compared in various ways. The data did not permit an intensive study of individual cases in respect to health and type of work.

Ill health was measured in terms of the number of days lost for long illnesses (illnesses lasting seven days or more) per year of service since record started. The reason for this criterion was that the health records applied only to a limited number of years within which there was any knowledge of the health of the individual. Further, it was obvious that those who had lost, for example,

twenty-five days through illness in one year, should not be put in the same health category as those who had lost only twenty-five days through illness in ten years. Thus in comparing the illness rates of two groups it was necessary to take into account not only the number of cases in each group but also the number of years that the individuals were present during the period when their illnesses would have been recorded. Although it might be of considerable importance, short-duration illness (under seven days) was not used as a criterion of ill health because records were not available. Lost time due to accidents was not considered. Otherwise, all lost time for illness was included, irrespective of the nature of the illnesses.

THE FINDINGS

The findings were as follows:

(1) Within each factory, A, B, and C, there was a higher incidence of ill health among fixed-pace than among non-fixed-pace workers. (See table I.)

(2) In all plants differences between fixed-pace and non-fixed-pace groups in respect to such factors as sex, age, length of service, working environment, efficiency, remuneration, marital status, or initial selection, were tested and found to be insufficient to account for the observed difference in health between these groups.

(3) In plants A and B, where such a comparison could be made, fixed-pace workers had appreciably poorer health than non-fixed-pace workers after, but not before, the installation of pace-fixing conveyors.

(4) At plant A poor health was not only greater in total amount among fixed-pace workers but was reported for a larger proportion of them.

Thus the findings indicated that fixed-pace work as used in these plants was detrimental to the health of the workers.

TABLE I

THE INCIDENCE OF ILL HEALTH AMONG FIXED-PACE AND NON-FIXED-PACE WORKERS

Plant	No. of Cases		Illness Index	
	Fixed-Pace Workers	Non-Fixed-Pace Workers	Fixed-Pace Workers	Non-Fixed-Pace Workers
A(Men)	173	189	228*	152*
A(Women)	90	87	320*	200*
B(Men)	40	242	157*	72*
C(Women)	62	150	14.3**	9.6**

*Number of days lost for long illnesses per 100 individuals per year of service since health record started.

**Number of days' absence per person within a two-year period.

SUPPORTING EVIDENCE

Under analysis, fixed-pace work as used in these plants was found to differ from non-fixed-pace work in that (a) the rate of working is imposed from

without, (b) the rate of working is the same for all workers, (c) the rate of working does not vary, (d) the rate of working approaches a maximum for most workers, and (e) the work is more highly repetitive. A survey of relevant studies reported in Great Britain and the United States indicated that these conditions characteristic of fixed-pace work have been found to be associated with feelings of strain and evidence of fatigue. Since strain and fatigue may lead to ill health directly, by bringing about a breakdown, or indirectly, by increasing susceptibility to infections, these studies lend support to the present finding.

In considering the significance of the association between fixed-pace work and ill health which this investigation has brought to light, there are certain factors which should not be overlooked.

THE SIGNIFICANCE OF SUBJECTIVE EFFECTS

Since fixed-pace work has an objectively measurable effect upon the health of workers it is highly probable that there are accompanying subjective effects of an undesirable nature. Fear of not keeping up with the machine, annoyance, feelings of tension or strain may contribute to the discomfort of many workers and may be significant sources of work-dissatisfaction and strained employer-employee relationship. It cannot be too strongly emphasized that a worker's behaviour is determined by the way his job appears to him, not by the way it may appear to the management or to other workers. Failure to take these subjective factors into account would undoubtedly impair the effectiveness of remedial measures.

Further research might well be instigated in order to determine the nature of workers' attitudes and feelings and to relate these subjective factors to the more obvious objective conditions of work. Numerous questions suggest themselves. Does ill health occur most among those who most dislike their work? Do fixed-pace workers like their work as well as non-fixed-pace workers? What aspects of the job do the workers most dislike? Are these aspects essential or non-essential? The advantages to be gained by the elimination of irritating, non-essential conditions of work scarcely need to be pointed out.

RECOMMENDATIONS

1. *Selection of Employees*

In appraising the present finding it is also of importance to recognize that within any group of workers there are marked individual differences in respect to health. Workers may differ, for example, in susceptibility to infection, predisposition toward nervous ailments, or fatiguability. Thus it is reasonable to expect that the effects of exacting conditions would vary in kind and degree with each individual.

Some employees might work under trying conditions for years without suffering any apparent deleterious effects, whereas others might be forced to discontinue working after a relatively short period of time. This would suggest the possibility of maintaining high levels of production and yet reducing or

eliminating entirely the ill health attributable to fixed-pace work by the careful selection of employees who were physically, mentally, and temperamentally suited to that type of work.

What type of employee should be selected for fixed-pace work? The final and complete answer to this question will come as a result of much intensive investigation in the actual work situations. However, drawing mainly upon the experience of the Industrial Health Research Board in England, the following recommendations would appear to be warranted.

(a) *Health.* Give preference to younger men in good health who have absolutely no history of nervous or gastric disorder and who have been relatively free from infectious diseases.

(b) *Intelligence.* It is desirable to select *less* intelligent individuals for highly repetitive work of this kind. The more intelligent employees will tend to become bored more readily and are more likely to find the work distasteful.

(c) *Emotional Stability.* It is not sufficient that those employed for such work should have had no previous "nervous" illnesses. They should be examined and found free of all minor "nervous" symptoms. Those exhibiting such minor symptoms have been found to "break down" much more readily.

(d) *Manual Dexterity.* Those who do well in tests of manual dexterity will in all probability not only learn their job more rapidly but also maintain required levels of production with less effort on their part.

(e) *Temperament.* Give preference to those who exhibit steadiness, persistence, imperturbability and placidity rather than to those who are animated and variable, expressive, or easily distracted.

2. *Rest Pauses*

In many plants conveyor workers are given one or two regular rest pauses during the day. In addition, there are a number of casual rest pauses of varying lengths which occur whenever there is a mechanical breakdown or whenever a worker runs out of material or fails to maintain the required pace. Although these delays decrease the total time of working for the employees involved, they do not have the beneficial effects characteristic of regular rest pauses. During regular rest pauses workers are usually permitted to leave their places of work to lie down, exercise, talk and smoke. In such circumstances a relatively high degree of relaxation is possible. Delays, on the other hand, occur unexpectedly, they are of undetermined length, they reduce efficiency and pay, and consequently they tend to become a source of irritation and annoyance rather than an opportunity for relaxation.

In such cases it is most probable that the introduction of additional regular rest pauses would increase plant efficiency. Additional rest periods would provide further opportunities for mechanical inspection and for restocking materials. Moreover, as these rest periods would lessen fatigue and break monotony, there would probably be a substantial reduction in the number of "unavoidable" delays due to errors and due to the failure of the slower workers to "keep up."

3. *Variation of Machine Speeds*

There is a further consideration. It is known that workers show characteristic variations in efficiency throughout the day, depending upon the individual, the length and distribution of work periods, and the type of work. This fact would seem to have been largely ignored. The speed of most machines remains constant throughout the day. Thus fixed-pace work would interfere with the changes in rate of output which would ordinarily follow changes in the capacity of the worker due to fatigue. In such circumstances fatigue would probably be further intensified. Such a tendency might be largely mitigated by varying machine speeds at different periods of the day in accordance with fatigue curves.

SUMMARY

In conclusion, we have found that highly repetitive fixed-pace work of the kind generally associated with machine feeding operations or work on conveyors is to a measurable degree detrimental to the health of the workers. We suggest that it *may* be possible to reduce or eliminate entirely the ill health attributable to fixed-pace work, without reduction of output, by eliminating non-essential conditions of work which may be continual sources of irritation to some individuals, by a more careful selection of employees, by the substitution of systematic for casual rest pauses, by varying machine speeds throughout the day or week in accordance with appropriate fatigue curves. Failing this, it may be necessary to resort to such expedients as the lowering of machine speeds, the use of longer or more frequent rest pauses, or the regular and frequent shifting of workers from one job to another.

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Health Education---Through the Drug Store Window

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HEALTH education through the drug store window is not new, if one's interpretation of "health education" is sufficiently liberal. Commercial health campaigns of all types have made their appeals from the corner drug store for many years. Life-size posters of glamorous young ladies extol the merits of this or that aid to better health, and bewitchingly appealing baby photographs catch the eye of the fond parent. These and many more attractive displays have helped to make the passing parade more conscious of the desirability of healthful living.

Can a non-commercial health educational display hope to capture favourable attention from a public whose taste in drug store displays has been conditioned by expert advertising men?

We believe the answer to that is "yes", *but,* like the formula for rabbit stew—"first catch the rabbit"—it is necessary first to convince the druggist that his generosity in donating window space will not have unfavourable repercussions.

When one considers some of the shoddy posters which used to find their way, occasionally, into a display window (largely because the store proprietor's heart ruled his head) under the guise of "health education", it is small wonder that this field of publicity was not productive.

Competing for attention with interesting, high-quality commercial publicity releases of various types, requires the production of materials and programs calculated to place health education on a par with the best. Fortunately, increasingly higher standards in public health education are making it possible for educators to use publicity mediums previously considered difficult of access.

Venereal disease has always been considered a hard subject to propagandize, a subject which has taxed heavily the educator's creative talents. It has literally had to fight its way up from the public lavatory placard stage to its recently acquired radio entree to your home and mine. The grim, uninspired "social disease campaign" (which appeared to measure its success by the number of persons who turned pale or fainted at the gory details) is as outmoded as the nickelodeon. Its place is being taken by educational programs which are making citizens more and more aware that *venereal disease is a public health problem.* It is being publicized on a *positive,* dignified basis which removes the gutter stench without minimizing its seriousness as a menace to the public health.

Can venereal disease education be successfully carried on through the drug store window? Let us consider these facts.

The preparation of a drug-store window display featuring venereal disease education is a delicate matter. Unlike a lecture, which can be varied to suit

specific audiences, the window display is seen by people of all ages and types. Reactions of the passers-by are likely to vary from hearty approval to indifference, and even shocked disapproval. Recognizing this, the drug store proprietor will not willingly co-operate unless the display is sufficiently high-grade to assure widest acceptance. Refusal to grant space for a low-quality display cannot, in fairness, be imputed to the druggist's lack of interest in public health education. He simply has to protect his business and prestige.

This reluctance to accept poor material is a good thing, for it forces the health educator to improve the standard of his publicity releases. This, in turn, raises the level of public interest and increases response to the particular appeal.

> The greatest feeling of satisfaction any druggist can experience is the knowledge that he is the trusted friend of his community.
>
> With that trust, a mantle of responsibility must be accepted, and I am proud to say that, with rare exceptions, that responsibility is fully appreciated.
>
> Since the foremost aim of the druggist is to work with the medical and allied professions in bringing about the highest possible level of community health, he has a clear-cut responsibility to assist in the advancement of public health measures.
>
> The B.C. Pharmaceutical Association has always cooperated closely with the Provincial Board of Health in the development of the venereal disease control program, and it is happy to lend its active support to such projects as that described in the accompanying article.
>
> Robt. C. Lang
> President of the B.C.
> Pharmaceutical Assoc.

In British Columbia, the Provincial Board of Health recently conducted a province-wide prenatal syphilis prevention educational program. One of the outstanding features of this program was the use of drug-store windows for exhibiting a specially-prepared display unit (see figure I).

In planning such a unit, the following factors were considered:

(a) *Quality of Material*

What type of display would be most acceptable to the druggists and the public?

(b) *Nature of Appeal*

A positive or negative approach? Should the display emphasize the terrible consequences of prenatal syphilis, or the healthy normalcy of the non-syphilitic infant?

(c) *Brevity of Message*

Would self-consciousness cause most people to give not more than a hasty look at the display when it was observed that it had to do with syphilis?

(d) *Results*

What results were desired?

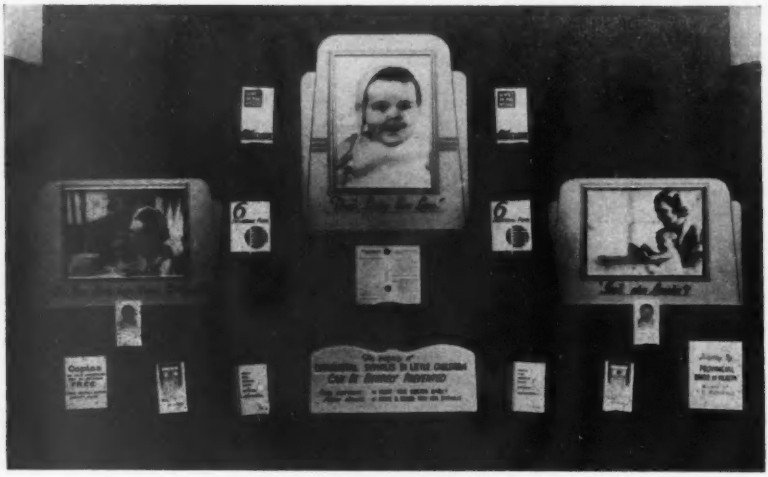

FIGURE I. Drug Store Window Display

As will be noted from the accompanying illustration, the display comprised three photo panels. The photographs were selected, obviously, for their appeal to sentiment. The frames, in appropriate pastel blue and pink, were designed for simplicity and dignity. The display spelled "q-u-a-l-i-t-y" without ornateness.

The type of photographs used permitted only one approach: positive. It was reasoned that the *desire* to have a baby as healthy, happy and lovely as the ones pictured would provide as great a stimulus to expectant mothers to have a routine blood test as would the unpredictable influence of the "horror" theme.

The type of message and its length were determined by two probable factors:

(a) The average person views a window display casually and hurriedly. Any message, therefore, has to be succinct in order that its focal point may be readily absorbed.

(b) Most people are still self-conscious about being seen in a public place taking any interest in a venereal disease exhibit (unless, of course, all persons are assembled there for the purpose of observing such a display). It was anticipated that when the viewer was conscious of the nature of the exhibit he would not stop to study it openly. (Other public health exhibits, dealing with such subjects as tuberculosis or nutrition, would not suffer from this disadvantage.)

The focal point of this particular message was "Congenital syphilis can be prevented". The secondary message was: "Every expectant mother should visit her doctor early and have a blood test." A third message, for those who paused long enough to read it, was to the effect that free literature could be obtained inside. Each could be read at a glance.

What about results? Well, there were two objectives in mind. First, to condition our citizens to seeing the word "syphilis" in a public place under dignified circumstances. This would serve to augment other educational efforts

to make people think and talk more freely about venereal disease and divorce them from remaining traces of mid-Victorian prudery. Second, to make them conscious of syphilis as a menace to the babies, and the fact that it is PREVENTABLE. Obviously, it was hoped that the desirability of every expectant mother visiting her doctor early in pregnancy and having a routine blood test would be noted.

But, someone may inquire, if as little attention is likely to be given to the display as seems indicated, why go to the trouble and expense of preparing an attractive exhibit? Why not a simple poster with the same message?

Let's answer that this way: For a long time venereal disease was associated with everything shameful. Lecturers described terrible consequences, moving pictures showed ghastly lesions, and the victims of syphilis or gonorrhoea were regarded as miscreants receiving justly deserved punishment. With what results? "Nice" people refused to discuss venereal disease; health authorities received little encouragement to persevere with control measures. Prudery and "hush-hush" dominated the scene. Venereal disease infections occurred with unabated frequency.

Since venereal disease is a *public health problem*, it is absolutely essential to successful control to have an enlightened public opinion regarding it. That enlightened public opinion can only be brought about by making our citizens consider venereal disease in the same reasonable, objective and frank manner as they would, say, tuberculosis.

So long, therefore, as venereal disease continues to be associated with baseness, just that long will the problem lack general public support.

One of the West Coast's most prominent display men, George G. Fleming, President of the G. G. Fleming Co., Ltd., has this word of advice for the health educator:

When you bought your fountain pen and were trying out the nib, what did you write?

If you were an average person, nine chances to ten you wrote your *own name.*

Why? Because nothing interests people more than themselves.

A successful sales campaign featuring a product or a health service must, therefore, have a direct appeal for the individual. It must point out clearly and simply how it will benefit him.

This benefit need not be in tangible form—such as the amount of weight gained by drinking milk. It can be attained by the personal satisfaction of doing a good deed—subscribing to a Crippled Children's Fund, for example. In either case, a successful sales appeal will imply that a *personal benefit* will be gained by following the suggestion.

This plan was successfully carried out in the recent campaign in British Columbia to wake up the people to the seriousness of congenital syphilis to infant life.

The Division of V.D. Control used the greatest eye appeal known—'The Happy Baby'—and dared men and women who passed by to think of his or her responsibility to the infant yet to be born. It also invited them to learn how to keep healthy and free from disease. A personal message was there, which no thinking man or woman could ignore.

The health educator should keep three principles in mind:

(1) Personalize the appeal.
(2) Make the appeal attractive.
(3) Never use a negative approach.

Remember! One picture is worth ten thousand words and that nothing interests people more than themselves.

If, through attractive, wholesome window displays (however cursorily they may be initially examined) the citizen's level of association is raised, then an encouraging step forward will have been made in educating him.

There is, incidentally, no need to worry that bringing venereal disease out of the gutter will diminish public regard for its seriousness. Does anyone think tuberculosis a disease to be regarded lightly just because people can converse about it without a feeling of shame?

What do the druggists themselves think about this exhibit? One prominent drug store proprietor in the city of Victoria has this to say:

"The reception of this window and the inquiries made by the public for literature has been marvelous. It most certainly proves that they wish to be informed on all the aspects of venereal disease control. It is a pleasure to help in this grand work."

With eight of these window educational exhibits circulating throughout the Province of British Columbia, the druggists are making a fine contribution to their communities in advancing public health.

Since window advertising space is one of the chief assets of a drug store, is there not a possibility that some druggists may be reluctant to give choice space to a commercially non-productive display? We do not believe this is the case, for it has been our pleasant experience (and we are confident this is typical) that the druggists have a strongly developed sense of community responsibility. You can be certain that they will cooperate willingly and effectively with any genuine, worth-while project directed to the improvement of public health.

Yes, public health education through the drug store window is within reach of any health educator who will recognize the need for observing sound advertising principles and who will not take unfair advantage of the druggist's desire to serve his community.

If it can be done with venereal disease educational projects, other public health problems should find the sailing comparatively smooth!

The Sanitary Inspector and Public Relations*

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THE relationship of the sanitary inspector to those with whom he has direct dealings as well as to those with whom he may come in contact indirectly in the pursuance of his duties may be discussed under several headings. Primarily we must take into consideration his position as a public health official. Secondly, as a result of his official status, we must consider the various problems which arise in the application of his authority so that the maximum benefit to the public will be the result.

Public health authorities have found through many years of intense study that there exists a definite tendency towards uniformity in health matters based upon natural laws. Further, that in the knowledge of these natural laws, and of the laws of health, obtained by generalized instruction—i.e. that smallpox is communicable and may be fatal, that dampness is injurious and that raw milk may be the medium for the transmission of various diseases, and that the thousands of established facts which constitute the science of modern hygiene should not be left to individual experiment—lies the key to the physical improvement of a community or a nation. Something more also is required than the mere picking up of scraps of knowledge. The cultivation and maintenance of health should be a regular subject of instruction, and the more condensed the aggregation of individuals, the greater the necessity for the observance of the laws of health by each particular person.

The sanitary inspector as a public health official is one of the direct results of the realization on the part of public health authorities of the need of a contact between themselves and the public; a contact through which the various complexities of the sciences involved in modern hygiene are reduced and presented in a practical manner and designed to be acceptable to the public. He is now one of the officials authorized to enforce the regulations governing sanitary matters in any municipality.

Naturally then it follows that such an official can be a source of immeasurable benefit to a community. Let us dwell briefly upon the various factors which determine his relationship with the public.

To be the desired type of official the sanitary inspector must first be an individual of the strictest integrity. This statement requires no further comment. He must have a reasonably acceptable personality, for upon the impression he creates upon those with whom he comes in contact will depend greatly to what extent will be the good results of his endeavours. He must be in possession of

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a sound primary education in addition to some knowledge of the various sciences upon which public health itself stands, in order that he may become efficient in all branches of his particular field of work. This development has in latter years resulted in the establishment of a course of study and practical field work in all branches of sanitation, food control, and the control of communicable diseases, with the granting of a certificate of competency to those who may successfully pass the oral and written examinations set, as well as their presenting approved written reports upon the inspections and observations made by them while engaged in the practical tests included in the examinations.

Now that we have the sanitary inspector established as a public health official having the requisite knowledge to be of service to the community, let us turn for a moment to his initial contact with the public. Speaking generally, this is brought about by two routes. One is established during the course of routine investigation, and the other when the inspector is called upon to deal with some particular complaint. The first matter the inspector must decide upon is his manner of approach. We know from experience that no stereotyped method can be adopted but that each case must be dealt with according to the circumstances surrounding it. However, one definite rule can be established, and that is that nothing is more undesirable than a domineering, officious approach. Rather, the work of the sanitary inspector should be conducted in the light of an educational movement. This means then that the inspector should aim at the development on the part of the public of what may be termed a "public health consciousness." The sanitary inspector of the present day differs considerably from his old-time counterpart who regarded himself as a law-enforcement officer. This has been achieved by a recognition that the results attained by ensuring that the public appreciated the necessity for and the principles involved in a public health requirement were far in advance of those obtained by compulsion through process of law. The inspector must also bear in mind that while authority is vested in him, he is still the representative of his superior officers and that on occasion he may find it necessary to reserve judgment upon some question until he either has his opinion certified or some other course of action decided upon. So the inspector must approach the public with an open mind on the matter being dealt with even to the point of placing himself in the same position as the public in order to understand their viewpoint. I might at this juncture cite the case of the dairy industry. There is probably no other industry with which the sanitary inspector has been connected in the safeguarding of the health of the citizens in which so much capital has been expended or so rapid advancement made. I think I am prudent when I say that the sanitary inspector is responsible to a large extent for the advancement of this industry because of his influence in creating a desire on the part of those engaged in it for absolute cleanliness and the adoption of maximum safeguards.

There are also certain branches of the work assigned to the sanitary inspector which fall short of law enforcement and in which the only recourse he has is to persuasion.

On occasion, however, after everything possible has been done, the inspector

will find it necessary to resort to legal proceedings in order to effect the abatement of a nuisance. In this contingency he also has a definite duty to the public. He must first be convinced that a public health nuisance exists and then be prepared to conduct his case against the offender to a successful conclusion. However, one point should be borne in mind, that the inspector should not harbour any vindictive feelings towards the offender, either before or subsequent to court action, but rather be prepared after such action to continue to give advice and to assist in any way he can in a true spirit of co-operation towards a removal of the offending condition.

The sanitary inspector also has relations with the appointed or elected representatives of the public, namely the Local Board of Health. While in larger centres the inspector does not deal directly with this body, such is not the case in smaller municipalities. In these places the inspector may have more frequent and direct dealings with the Local Board than has the Medical Officer of Health. He must be prepared therefore to submit comprehensive reports to either the Local Board of Health or the Medical Officer of Health which will interpret clearly to them the actual conditions with which he has been dealing, as well as indicating the attitude of the individuals concerned towards any requirements he may have outlined. If required to, he should be in a position to report upon the general public health status of his community.

In concluding this brief presentation of the subject it may be said that the sanitary inspector of the present is fully aware of his responsibilities and of the value of establishing a harmonious relationship between himself and the public; that the public have become imbued with a more enthusiastic spirit of co-operation, as evidenced by the progressive reduction in the number of prosecutions instituted annually by public health officials. As a result we will find the sanitary inspector assuming more and more the role of an educator in the field of public health and with this transposition the benefits to the public will be multiplied.

LABORATORY SUPPLEMENT

FOR THE PRESENTATION OF TECHNICAL PAPERS IN BACTERIOLOGY, PATHOLOGY, IMMUNOLOGY, CHEMISTRY, PARASITOLOGY, AND ALLIED FIELDS IN RELATION TO PUBLIC HEALTH

An Account of Four Sporadic Cases of Illness Associated with *Salmonella bareilly**

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OF late years interest has been aroused in sporadic cases of food infection due to members of the Salmonella group.

During the summer of 1941 the occurrence of nine cases, apparently unrelated, of food infection in the vicinity of Kingston, Ontario, led to a study of the bacterial strains isolated. Four of these strains are sufficiently rare to warrant mention, being due to *Salmonella bareilly*.

The development in our knowledge of this Salmonella type is interesting and may be reviewed briefly. The organism was first isolated at Bareilly in India from three human cases of mild fever occurring among Indian soldiers in 1928 and 1929, two of the strains being derived from blood culture, and one from faeces. The illness was similar clinically, in the three cases, being characterized by a continued fever lasting from eight to twelve days and simulating an enteric infection. The biochemical reactions of the organisms resembled closely those of *Bact. paratyphosum* C. Their antigenic structure was studied by Bridges and Scott (1931) who, using White's notation, assigned the components as V(+?) : G, A, B, C, E 1 and 2.

Kauffmann and Silberstein (1934) also investigated these three strains and another of the same type sent by the late Professor Jordan of Chicago. According to the Kauffmann-White Schema† the antigenic formula is VI, VII : y, 1, 3, 4, 5.

Jungherr and Clancy (1939), working with fourteen organisms isolated from chicks suffering from paratyphoid infection, detected one strain as *S. bareilly*, according to its antigenic structure. They state that *S. bareilly* had not been reported previously as occurring either in man or animals in the United States of America.

Schiff and Saphra (1940) in a study of human paratyphoid C infections encountered one case (a butcher's wife) from which three members of the

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†The Kauffmann-White Schema is given in Acta Path. et Microbiol. Scand., 1939, XVI, 278, and in Kaufmann's book (1941).

Salmonella group were isolated, viz. *S. bovis morbificans, S. virchow,* and *S. bareilly.*

The case histories may be described briefly.

Case No. 1: Mrs. C. W. H——, 55 years, states that she attended a convention in Belleville from April 15-18, 1941, and returned to her home in Kingston with a severe headache. She experienced slight nausea but neither vomiting nor diarrhoea. A week later (April 25th) she was forced to go to bed on account of the intensified headache and called her physician who recorded her temperature as 102° F. During the next week she had frequent "chills", the temperature rising to 103° and 104° F. Thereafter the temperature subsided but the patient was kept in bed until the middle of June on account of a low-grade temperature. There was no diarrhoea at any time during her illness, but rather constipation. Her physician seemed to be in doubt as to the nature of the illness, and only on May 16th was a sample of blood taken for culture. An organism, presumably pathogenic, isolated from the blood culture gave biochemical reactions suggestive of *Bact. paratyphosum* B, viz. acid and gas in glucose, mannite, dulcite, maltose, inosite, arabinose, sorbite, galactose, laevulose, rhamnose, xylose, mannose and trehalose. The organism was Gram-negative, motile, and failed to produce indol. Samples of faeces submitted on May 16th, May 20th, and June 10th were examined without finding an organism similar to that isolated from the blood. The organism was not agglutinated by the following specific antisera: *Bact. paratyphosum* B (H sp.), *Bact. aertrycke* (H sp.), *Bact. enteritidis* (Gaertner) (H), *Bact. paratyphosum* A (H) and (C) (H sp.), but was agglutinated to full titre by polyvalent Salmonella (H) serum. A sample of blood received on May 29th agglutinated suspensions of *Bact. typhosum* (H) in 1:100 dilution and of group Salmonella in 1:50 dilution, but failed to agglutinate suspensions of *Bact. typhosum* (O), *Bact. paratyphosum* B (O), *Bact. paratyphosum* A (H), B (H sp.) and C (H sp.), *Bact. aertrycke* (H sp.) and *Bact. enteritidis* (Gaertner) (H).

Case No. 2: Mrs. C. A——, 79 years, began to suffer from nausea, vomiting, and diarrhoea on June 23, 1941. These symptoms persisted for a week and resulted in increasing weakness. Although the patient had a desire for food she was unable to retain it, even in fluid form. She was admitted to hospital on June 30th, and subjected to a careful physical examination. On account of her age and the presence of a palpable mass in the epigastrium, X-ray films of the stomach and duodenum were taken but evidence of ulcer or carcinoma was not detected. A sample of faeces examined on July 1st yielded a non-lactose fermenting organism, which showed fermentation reactions similar to those of *Bact. paratyphosum* B but was not agglutinated by specific antisera to *Bact. paratyphosum* B (H sp.), *Bact. aertrycke* (H sp.), *Bact. enteritidis* (Gaertner) (H), *Bact. paratyphosum* C (H sp.), polyvalent Salmonella (H), or *Bact. aertrycke* (O).

Case No. 3: Leonard J. P——, 24 years, a medical student in his fifth year and interning in the Hotel Dieu, Kingston, attended a picnic on Monday, June 23, 1941, at which sandwiches, previously prepared at the hospital, were eaten.

On returning to the city later in the evening, he ate a sandwich (either cheese or hot meat) at one of the local restaurants. The following day he felt rather tired but there were no definite symptoms of illness. Early on Wednesday morning he complained of general malaise, headache, muscular pains and frequent attacks of diarrhoea with blood and mucus in the stools, and was admitted as a patient to the hospital. Temperature was 100.4° F. and pulse rate 100 on admission. On Thursday he suffered rigors followed by profuse perspiration, the temperature rising to 102.4° F. On Friday, the patient seemed to be in a toxic condition and had frequent loose stools. On Saturday, he complained of cramps in the abdomen and persistent diarrhoea, the stools being tinged with blood, and passed a restless night in spite of the administration of a sedative. On Sunday, June 29th, sulphathiazole, sodium bicarbonate, and bismuth hydrate were administered and continued until July 1st. The symptoms decreased gradually and the patient was discharged from hospital on July 6th.

The physician in attendance sent a sample of stool and of blood for Widal test on June 29th and from the stool an organism was isolated which gave biochemical reactions typical of *Bact. paratyphosum* B. This organism was not agglutinated by the following specific antisera: *Bact. paratyphosum* B (H sp.), *Bact. aertrycke* (H sp.), *Bact. enteritidis* (Gaertner) (H), *Bact. paratyphosum* C (H sp.), polyvalent Salmonella (H), *Bact. aertrycke* (O) and *Bact. typhosum* (O). The blood serum agglutinated suspensions of *Bact. typhosum* (H), *Bact. typhosum* (O), *Bact. paratyphosum* B (H sp.), *Bact. aertrycke* (O) and *Bact. paratyphosum* A (H), all in 1 : 50 dilution,—evidence of previous T.A.B. inoculation.

Case No. 4: Mabel D——, a nurse in the Belleville General Hospital, took ill at the beginning of July 1941, with symptoms of fever and diarrhoea. The attending physician noted in the form accompanying the sample of blood sent for a Widal test, that the patient had received T.A.B. vaccine five years previously. A non-lactose fermenting organism was isolated from the faeces on July 5th and gave the typical fermentation reactions of *Bact. paratyphosum* B. The organism was not agglutinated by the following specific antisera: *Bact. paratyphosum* B (H sp.), *Bact. aertrycke* (H sp.), *Bact. enteritidis* (Gaertner) (H), but was agglutinated by a Salmonella group serum to full titre and by a *Bact. paratyphosum* C (H sp.) serum to half titre.

Table I summarizes the clinical findings, the bacteriological and the serological results.

DISCUSSION

In the account given by Bridges and Scott (1931), the clinical type of illness simulated the mild enteric fevers occurring in India, and was characterized by a continued pyrexia of over a week's duration with headache, slow pulse rate, constipation, and mild bronchitis. Recovery took place generally in a few days. They also remark that one of their bacterial strains, isolated by blood culture, was derived from an outbreak of fever in which twenty men in a unit were almost simultaneously affected, three of the cases requiring admission to hospital. This

TABLE I

CLINICAL FINDINGS AND BACTERIOLOGICAL AND SEROLOGICAL RESULTS IN FOUR CASES OF FOOD POISONING, KINGSTON, 1941

Patient	Sex and Age	Characteristic symptoms	Biochemical characters of organism isolated	Action of specific antisera on organism isolated	
				Not agglutinated by	Agglutinated by
C.W.H.....	F 55	Simulated mild enteric fever.	Similar to those of *B. para.* B	*B. paraty.* B (H sp.) *B. aertrycke* (H sp.) *B. ent.* (Gaertner) (H) *B. paraty.* A (H) *B. paraty.* C (H sp.)	Polyvalent Salm.
C.A.....	F 79	Simulated a food-poisoning attack.	Similar to those of *B. para.* B	*B. paraty.* B (H sp.) *B. aertrycke* (H sp.) *B. ent.* (*Gaertner*) (H) *B. paraty.* C (H sp.) Polyvalent Salmonella	
L.J.P.....	M 24	Sharp attack of food-poisoning.	Similar to those of *B. para.* B	*B. paraty.* B (H sp.) *B. aertrycke* (H sp.) *B. ent.* (*Gaertner*) (H) *B. paraty.* C (H sp.) Polyvalent Salmonella	
M.D.....	F	Simulated a food-poisoning attack.	Similar to those of *B. para.* B	*B. paraty.* B (H sp.) *B. aertrycke* (H sp.) *B. ent.* (*Gaertner*) (H)	Polyvalent Salm. *B. paraty.* C(H sp.)

occurrence suggests a food infection, although the authors do not state this possibility.

In the four cases described in this paper, the symptoms were of such severity as to necessitate hospital treatment. The specific organism was isolated from the blood in one case (C. W. H.) in whom a persistent low-grade fever and constipation were the chief features of the infection, and from the stools in three of the cases (C. A., L. J. P., M. D.) in whom fever and severe diarrhoea were the important signs.

It would appear that this Salmonella type may cause fever and constipation in some cases and in others fever and diarrhoea. The former type of illness simulates typhoid fever in its early stage when fever and constipation are associated with a bacteraemia; the latter type of illness corresponds with a later stage when fever and diarrhoea are present, the organism being then easily isolated from the faeces.

In the experience of the medical student (L. J. P.), from whom precise details of the illness were obtained, the onset strongly suggests a dysenteric infection from food, although the particular article of diet was not incriminated. It may be assumed that the onset of symptoms was due to eating the "restaurant" sandwich thirty to thirty-six hours previously, since no other member of the picnic party suffered any discomfort from eating the "hospital" sandwiches.

As it was possible to secure more details from the medical student than from the other patients, the information obtained shows that the time of onset, duration

of illness, and convalescence vary definitely from attacks of staphylococcus infection and from enteric disease. In food poisoning due to staphylococcus infection the onset varies as a rule from two to six hours; vomiting, abdominal pain, and diarrhoea are marked features: the severe symptoms last two or three days and the patient makes a rapid recovery. In Salmonella infections the symptoms may appear on the first or second day after ingestion of the contaminated food, the severe illness may persist for one or two weeks and the convalescence may occupy a period of two weeks. In enteric disease associated with *Bact. typhosum* and *Bact. paratyphosum* B, the periods of onset, acute illness, and convalescence are considerably longer than those observed in Salmonella food infections.

Cultures of the organisms isolated were sent to two laboratories in the U.S.A. for determination of type according to the Kauffmann-White Schema. Before the outbreak of the present World War an International Salmonella Centre was established by Dr. Thorvald Madsen at Copenhagen and supported financially by the Commonwealth Fund in order to afford facilities for the typing and classification of recently isolated organisms of the Salmonella group. Specific immune sera and test cultures were made available for National Salmonella Centres in different countries to which suspected organisms could be referred. The Department of Bacteriology of the Beth Israel Hospital, New York, and the Department of Animal Pathology, University of Kentucky, possess facilities for such typing and assigned to the four cultures referred to in this paper the designation *Salmonella bareilly*. This organism has the following antigenic components: $VI_1 . VI_2 . VII \ldots y \leftrightarrow 1, 5 \ldots$ where the somatic (O) antigens are given in Roman numerals, specific flagellar (H) antigens in small letters, and the group flagellar antigens in Arabic numerals.

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Coliform Organisms Found in Private Wells*

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PRESENTED with the opportunity of analysing a considerable number of water samples from private wells, it was decided to determine to what extent the rapid method of confirming lactose broth presumptives by the use of lactose brilliant green bile broth, as outlined by Howard, Lochhead and McCrady (1), detected those members of the coliform group which have been claimed by many workers to be indigenous to soil, grain and organic matter. By such members are meant those of the *Aer. aerogenes* and Intermediate groups which presumably might be present in farm wells in greater numbers than in water from larger, municipal supplies.

Source of Samples

The work entailed the examination of 1400 samples of water submitted in sterile containers, with answers to questionnaires. Directions for taking the sample were included with each container. The samples, with a few exceptions, were from farm and school wells in various districts of Ontario. The exceptions were samples from ponds, streams, and an occasional storage tank in a dairy. The samples were tested as soon as they reached the laboratory.

Procedure

The method of isolation of the organisms was as follows: from those lactose tubes containing the highest dilution of water showing gas at 37° C. in either 24 or 48 hours, a loopful was transferred to lactose brilliant green bile 2 per cent (Difco) and an eosin methylene blue (Difco) plate was streaked. If, after 48 hours at 37° C., there was no gas in the lactose brilliant green bile broth tube and no typical colonies were found on the eosin methylene blue plates, identification was not carried further. If gas was found in the lactose brilliant green bile broth, either at 24 hours or 48 hours, irrespective of the results on eosin methylene blue plates, a new plate was streaked directly from the brilliant green broth, and the resulting culture fished from this second plate. Thus every culture examined was isolated from lactose brilliant green bile broth and not directly from the original lactose positive tube. Isolated cultures were transferred to nutrient agar slants and completed in the usual manner according to Standard Methods of the American Public Health Association (2). Differential tests were then conducted as soon as possible.

Differential Tests

As is the general practice, that quartet of tests (indol production, methyl red and Voges-Proskauer reactions, and citrate test) constituting the so-called

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"IMViC" reactions, was used to determine the relationships of the isolated organisms. Also included were: sucrose fermentation, hydrogen sulphide production, gelatin liquefaction and fermentation of lactose at 44° C. It was realized that with other media and tests, further subdivisions could be obtained, but it was felt that the identification of groups was of more significance than the identification of individual strains.

Indol Production

This was determined by incubating the cultures for 24 and 48 hours, using a 1 per cent Bacto-tryptone broth and testing with Kovac's reagent (3).

Methyl Red and Voges Proskauer Reactions

Because of the many modifications of these tests and the conflicting irregular results obtained, four different methods for the Voges Proskauer reaction were compared. These were done in triplicate on fresh and older cultures. The methods used were: that advised by Standard Methods (2), Barrett's method (4), that of O'Meara (5), and Leifson's method (6). Results were based on agreement of Voges Proskauer with methyl red reaction, speed of reaction after addition of reagent, intensity of resultant colour and influence of incubation. The method by Barrett (4) was found to give the most consistent results. This confirms recent work by Osterman and Rettger (7). Methyl red tests were completed after 48 hours at 37° C. using Bacto-V.P., methyl red dehydrated medium.

Citrate Test

The method advised by Standard Methods of the American Public Health Association (4) was used.

Hydrogen sulphide production, sucrose fermentation and gelatin liquefaction tests were conducted according to standard approved methods.

Incubation of Lactose at 44° C.

Because of the growing interest by various workers (8), (9), (10) in the possibilities of an incubation temperature of 44° C. being of further assistance in separating faecal *Esch. coli* from other allied groups, it was determined to include this method. Because pure cultures were to be tested instead of original dilutions of water, plain brown cresol purple lactose broth was employed instead of MacConkey's medium or any modification of Eijkman's medium. The lactose tubes were preheated and maintained at a temperature of 44° C. during inoculation, and were incubated in an electric, water jacketed, thermostatically controlled incubator maintaining a temperature of 44° C.$\pm$0.3.

RESULTS

Lactose Brilliant Green Bile Broth Negative Tubes

Out of a total of 1400 samples of water, 174 samples showed gas in lactose broth in one or more dilutions. Of the 174 samples, 48 lactose positives from the highest dilutions, varying in amounts of gas from a bubble to 70 per cent,

when inoculated into lactose brilliant green bile broth, failed to produce any gas in the latter medium in 48 hours. Twenty-six of these negative samples produced no growth in eosin methylene blue plates and the remaining 22 produced slight, entirely atypical growth. As these 48 presumably spurious presumptives gave negative results in lactose brilliant green bile broth and little or no growth on eosin methylene blue medium, no further work was done with them. Of significance in the above, was the correlation between lactose brilliant green bile broth and the eosin methylene blue medium. In every case where the former was negative little or no growth resulted on the solid medium when inoculated from the original lactose broth tube.

Lactose Brilliant Green Bile Positive Tubes

Inoculations from the remaining 126 lactose positive tubes into lactose brilliant green bile broth showed gas in either 24 or 48 hours, with good, but not necessarily typical growth on eosin methylene blue plates. This was expected because of the possibility of different groups being present, which, although not true faecal *Esch. coli*, were capable of producing gas in the lactose brilliant green bile medium. No negative plates were found, however. The nature of the growth on the positive plates ranged from that produced by *Esch. coli* to the heavy, more spreading, mucoid type produced by *Aer. aerogenes* and allied species. As mentioned before, new plates were streaked from the positive lactose brilliant green bile tubes and the resulting colonies transferred to nutrient agar slants.

Classification of Isolated Groups

When evaluating and comparing the results of the "IMViC" differential tests, there was the usual difficulty of deciding which classification should be used. For reasons of simplicity, and in keeping with other workers, the classification adopted by the Ministry of Health (Appendix 1), Standard Methods (2), with an added group found in a classification referred to by Clegg and Sherwood (9), was used. The results are shown in Table I. The results of hydrogen sulphide production, sucrose fermentation, gelatin liquefaction and fermentation of lactose at 44° C. are included.

Fifty-two of 126 cultures proved to be citrate negative, of which 42 fermented lactose at 44° C. All 39 *Esch. coli* Type I cultures showed gas in lactose at 44° C., while 3 of the 8 *Esch. coli* Type II showed gas at 44° C. and 2 only acid at that temperature. Of the remaining 74 citrate positives, only one (*Aer. aerogenes* Type I) fermented lactose with gas at 44° C., although several showed acid reactions. Considering that incubation at 44° C. picked out 89 per cent of the *Esch. coli* Types I and II, 80 per cent of the citrate negatives, and only 1.3 per cent of the citrate positives, it would appear that fermentation of lactose at 44° C. shows promise when pure cultures are to be tested for the presence of faecal *Esch. coli.*

COMPARISON OF RESULTS WITH SANITARY SURVEY

It was hoped that a comparison of sanitary survey (as furnished by answers

TABLE I

CHARACTERISTICS OF 126 CULTURES ISOLATED FROM LACTOSE BRILLIANT GREEN BILE POSITIVE TUBES

No. of cultures	Type	I M Vi C reactions	No. of cultures fermenting sucrose	No. of cultures producing H_2S	No. of cultures liquefying gelatin	No. of cultures fermenting lactose at 44°C.
39	*Esch. coli* Type I	+ + − −	11	0	0	39
8	*Esch. coli* Type II	− + − −	2	0	0	3
34	*Aer. aerogenes* Type I	− − + +	28	0	0	1
13	*Aer. aerogenes* Type II	+ − + +	13	0	0	0
23	Intermediate Type I	− + − +	8	15	0	0
4	Intermediate Type II	+ + − +	4	1	0	0
5	Intermediate Type IX (Bigger) Irregular V aerogenes-like 1 (Wilson)	− − + −	2	0	0	0

to the questionnaires) with the various types of cultures isolated, would be of assistance in determining the importance of *Aer. aerogenes* and Intermediate groups. Sixty per cent of the wells furnishing lactose brilliant green bile positives were from 4 to 30 feet deep—shallow wells which, in many cases, were reported to be close to contaminating intestinal sources such as outhouses, cesspools, septic tanks and barnyards. Many of the samples from such wells, however, yielded only members of the *Aer. aerogenes* and Intermediate groups. On the other hand, not a few deep wells (100 to 200 feet), apparently far removed from intestinal sources, showed only the presence of *Esch. coli*. In view of these conditions, no satisfactory comparison could be made, and it would appear that the detection of *Aer. aerogenes* and the Intermediate groups is as important as the isolation of *Esch. coli* for the detection of intestinal contamination.

Of the 126 lactose brilliant green bile positives, 38 per cent proved to be faecal *Esch. coli*, according to the differential tests. Therefore, by this method, 62 per cent proved to be types that might, or might not, be of faecal origin. As the original intention of this investigation was to determine the presence of different groups in private wells by the method outlined, and not to determine their importance, no such theories regarding these groups need be advanced. However, because of the fact that so many of the *Aer. aerogenes* and Intermediate groups were detected by the lactose brilliant green bile method from wells which were apparently close to contaminating intestinal sources, the writer agrees with Taylor (11), Parr (12), and Bardsley (13) who emphasize the fact that until

these groups are definitely proved to be of soil and grain origin, they should still be considered indicative of faecal pollution. On this assumption, based on the tests in the above experiments, brilliant green bile lactose broth as a rapid confirmatory method of detecting coliform types in farm wells would appear to be quite satisfactory.

CONCLUSIONS

Fourteen hundred samples of farm and school well water were analysed to determine to what extent the rapid, confirmatory lactose brilliant green bile method would detect the various types comprising the coliform group of organisms.

Isolated cultures were tested by various differential methods and classified into separate and recognized types.

Sixty-two per cent of the organisms isolated belonged to types other than faecal *Esch. coli.* Because these members of the *Aer. aerogenes* and Intermediate groups were isolated from wells close to contaminating sources, they should be considered indicative of faecal pollution.

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HEALTH INSURANCE PROPOSALS IN CANADA

FOR more than a year, an intensive study of health insurance has been made under the direction of Dr. J. J. Heagerty, Director of Public Health Services in the Department of Pensions and National Health, by a committee representing the departments of the Federal Government whose interests relate to the subject of insurance in its varied aspects. From press reports and statements that have been made, the scope of the proposed health-insurance legislation, which it has been announced in the Speech from the Throne will be presented at this session of the House, is generally known. It is understood that a parliamentary committee will be appointed to study the bill.

All of the professional groups concerned have been invited to present their views. The Canadian Public Health Association, through a committee representative of all the interests in public health across Canada, has presented the place of preventive medicine and public health in a national scheme of health insurance. Representatives of labor, agriculture, women's organizations, both urban and rural, and of all other interested groups, have been accorded the opportunity of indicating essential considerations which in their opinion should be taken into account in the building of a satisfactory and adequate plan for Canada. There is sincere appreciation among these groups of the manner in which their representations have been received by Dr. Heagerty as chairman of the committee.

The proposed bill presents a plan sponsored by the Federal Government in which health insurance is provided on a provincial basis. The cost of the insurance is to be met by contributions from the Federal Government, the Provincial Government concerned, the employer, and the employed person. To be effective, it is obvious that the contributions from the employer and the employee must be compulsory. It is therefore a compulsory, contributory plan. The legislation falls into two parts, the first dealing with Federal responsibilities, and the second providing legislation that enables the Provinces, if they so approve, to adopt the plan of health insurance outlined in the bill. There is every reason to believe that the proposed legislation incorporates preventive medicine in its provisions. In the past, "health insurance" has been a misnomer; such legislation might more properly be described as "sickness insurance". If the provisions that assure an adequate place for the

practice of preventive medicine are adopted, Canada will have the first health insurance plan in which preventive medicine has received the attention that it merits. It is gratifying that the Canadian Medical Association, the Canadian Dental Association, and the Canadian Nurses Association all have emphasized the important place which preventive services should occupy in any adequate scheme of health insurance for Canada.

A NATIONAL SOCIAL HYGIENE DAY IN CANADA

DURING the past seven years a Social Hygiene Day, sponsored by the American Social Hygiene Association, has been observed throughout the United States. This year February 3rd was chosen. Surgeon General Thomas Parran broadcast a message which in a few sentences epitomised a nation-wide program. The message read: "Every community must organize its health forces against the venereal diseases. They can be controlled like other epidemics. For the individual, the solution of this problem is a personal matter of basic clean living—of avoiding the sources of infection. If every person in our country accepts full personal and community responsibility, we shall have tremendously improved national health and greatly strengthened the prosecution of the war."

There is no question that war conditions lead to an increase in the incidence of venereal diseases. Competent authorities in Great Britain report a seventy per cent increase in syphilis. Infection in the Armed Forces is from the civilian population. A study of the control measures among the troops stationed on the United States-Mexico border at El Paso* indicated clearly that medical inspection of prostitutes and other plans of supervision failed to reduce the incidence of venereal diseases. The closing of houses of prostitution was effective. In British Columbia, in Alberta, and in other Provinces, the effectiveness of adequate police measures in the suppression of commercialized vice has resulted in a decline in the incidence of these diseases. It is known that in many cities in which organized vice is not permitted, prostitution continues, frequently having as centres, public places well known to the police authorities. Such a situation calls for increased activity by police departments. Such action cannot be successful without a full measure of public support. The spread of these diseases can be controlled. Control, however, must depend upon an informed and awakened public, in the creation of which Church, State, and voluntary associations must make a united effort. The holding of the first Canadian Social Hygiene Day on February 3rd, under the aegis of the Health League of Canada, marks the first step in the nation-wide effort to force these diseases into the light and to subject them to a continuous, effective campaign for their control.

*Johnson, Bascom: *Prostitution in the Spread of Venereal Diseases in an Army Cantonment Area. Presented at the seventy-first annual meeting of the American Public Health Association, held in St. Louis, Mo., October 24-30, 1942.*

EUGENE GAGNON, M.D.

PUBLIC HEALTH and, particularly, vital statistics have lost an outstanding leader in the passing of Dr. Eugene Gagnon. There are few physicians who have the quality of mind and spirit to devote their lives to statistical research, and few have contributed so much as he to medical statistics, particularly in the field of demography. In his chosen field he had the satisfaction of achieving the development of a division of vital statistics in the Department of Health of Montreal which is outstanding in its scope and effectiveness. His ability as a health administrator as well as a statistician was recognized by his appointment as Assistant Director of the Department of Health in 1938.

Dr. Gagnon was born on July 30, 1877. He studied medicine at Laval University, Montreal, graduating in June, 1902. He entered the service of the Department of Health in 1914 and was the first superintendent of the Child Hygiene Division, a position which he held for ten years. In the field of teaching, he served on the faculty of the University of Montreal, both in the Faculty of Medicine and in the School of Public Health Nursing. He was one of the charter members of the Section of Vital Statistics and Epidemiology in the Canadian Public Health Association, serving as Chairman of the Section in 1934, and representing the Section on the Executive Council for many years. He was well known on this continent for his many scientific contributions to the leading medical and statistical journals.

The Canadian Public Health Association honours his memory and pays tribute to his faithful service in the cause of public health in Canada.

HAMILTON CHALMERS CRUIKSHANK, M.D., D.P.H.

DOCTOR HAMILTON CHALMERS CRUIKSHANK, Medical Officer of the Manufacturers Life Insurance Company for the past sixteen years, died in Toronto on December 25th.

Dr. Cruikshank was born in Hamilton on August 30, 1888. At the outbreak of the last war he joined the Canadian Army Medical Corps while still an undergraduate in the Faculty of Medicine at the University of Toronto, and served in France. He returned to Canada to complete his medical course and obtained his commission. In 1921, after receiving the Diploma in Public Health from the University of Toronto, he became Deputy Medical Officer of Health for the City of Toronto.

His appointment in 1926 as Chief Medical Officer of the Manufacturers Life Insurance Company was recognition of his outstanding work in the public health field. Bringing to his new duties an enthusiasm for preventive medicine and public health engendered by his years of practical experience, and possessing a keen appreciation of the value of social work, he developed the medical services of the Manufacturers Life Insurance Company in such a

way that new standards of values were established. To social agencies and medical and public health associations he gave generously of his time. He supported with characteristic enthusiasm the Visiting Homemakers Association at its inception and continued his guiding interest in the movement up to the time of his death. He served as treasurer of the Canadian Public Health Association for seven years, and had been a valued member of the Executive Committee for many years.

Those who know the story of his life know full well the unselfishness which characterized it and the kindliness of his nature which was always willing to share the burdens of others.

INDUSTRIAL HYGIENE ABSTRACTS

Dermatitis Control in a Mass Production Industry

IN this article, the author, who is on the staff of the Industrial Hygiene Laboratories of the Ford Motor Company, Detroit, Michigan, discusses the following factors which he considers of prime importance in the control of industrial dermatitis.

1. The encouragement of—and the necessity for—personal cleanliness of the worker, especially the skin: As uncleanliness of the skin is the chief predisposing cause of industrial dermatitis, personal hygiene is the first line of defence against skin infection. The employer should provide adequate facilities for the care of his employees' personal hygiene while at work. This includes sanitary washrooms equipped with hot and cold running water, a non-irritating soap, clean towels and, under certain conditions, bath showers.

2. The elimination of irritant material from contact with the worker, as far as is possible by engineering control: One method frequently used is enclosing or partially enclosing the operation so that solutions, fumes, vapors, or dusts are prevented from reaching the worker.

3. The use of protective clothing: It must be remembered that such clothing must always be kept in good repair and be properly cleaned and periodically disinfected. Two types of disinfecting solutions are mentioned —a weak solution of hypochlorite for rubber articles, and, for more delicate fabrics, a soap solution containing a coal tar or other disinfectant.

4. The application of protective hand creams by the employee: These products are intended for application to hands and other skin surfaces before exposure to any excessive dirt, grime and grease which is difficult to remove from the skin, or to industrial poisons likely to cause dermatitis. They form a protective film on the skin which acts as a barrier against harmful substances. Grease, paints and pigments are removed along with the cream by washing in ordinary soap and water. In any plant two or three of the standard types of cream are necessary and certain exposures may require a special cream.

In conclusion, the author refers to the experience of the Rouge Plant of the Ford Motor Company where these control measures combined with a good housekeeping policy and general plant cleanliness have lowered dermatitis cases to less than 1½ cases per 1000 men a month.

Thomas F. Mooney, Indust. Med., April, 1942, p.191.

Posture in Industry

THIS article deals with the subject of posture in industry as presented by Prof. H. A. Harris, Cambridge, at a meeting of the Association of Indus-

trial Medical Officers. He described posture as the "neuro-muscular mechanism by which man keeps himself right side up with the world, so that the world would appear right side up to him," and he stated the four elements in its maintenance as follows: (1) proprioceptive impulses from muscles, tendons, and joints; (2) semicircular canal impulses; (3) evidence of the visual fields; (4) tactile sensations, especially from the soles of the feet. If the influence of one of these four factors should be absent, steadiness or maintenance of position will be upset. For this reason when anyone is in such a position that the tactile sense of the feet helps to maintain position, it is important that his feet be warm and that he wear footwear to which he is accustomed.

The speaker went on to discuss certain movements which are important to the proper functioning of the body, such as rotation of the head, abduction of the eye-ball, abduction of the vocal cords, supination of the forearm, abduction and adduction of the fingers, opposition of the thumb, activated by the median nerve, eversion of the foot, and the action of the gluteal muscles.

He referred to the importance of remembering the ages at which certain epiphyses joined up in order that the strain of heavy lifting might be avoided at an early age where this would be dangerous. He explained why heavy lifting should be avoided by young boys and why girls under 18 years of age should not be called upon to stand for long periods. Many accidents are due to the fact that cramped posture does not allow muscles to respond rapidly when they are needed to do so.

In conclusion, Prof. Harris referred to the effect of factory work on women's health. He said there was no reason why such work should have any deleterious effect provided there was intelligent awareness of elementary medical and physiological facts.

Brit. M. J., July 25, 1942, p. 108.

Conjunctivitis

THIS abstract deals with sporadic epidemics of conjunctivitis which are occurring in war plants. Confined last year to plants on the West Coast, the trouble has recently made its appearance in the East. It does not seem to be an infection of occupational origin and is not only prevalent in industry but also among members of the workers' families. The United States Public Health Service has requested prompt notification of such outbreaks either in industrial plants or in communities, as spread of this infection to other industries must be prevented in order to avoid lost time in industries carrying on important war work. A worker suffering from the infection will lose a week or ten days from work, while under treatment. If untreated, the disease will last from three to four weeks.

Studies are now being conducted both from an epidemiological and an occupational standpoint. A virus isolated in the East corresponds to that believed responsible for the Western epidemic. The trouble usually begins in one eye. When acute it is manifested by swelling of the eyelids and enlargement of the small sacs of the membrane which lines them. The eyes become inflamed and "blood-shot". Typical cases also show swelling of the glands in front of the ear. Further progression may result in permanent impairment of vision.

Indust. Med., November 1942, p. 23.